THE CONTENTS OF THIS SECTION ARE
THE HIGHEST QUALITY AVAILABLE

INITIAL gg DATE 11/27/01

PAGE NUMBERING SEQUENCE IS INCONSISTENT

Appendix B

Functional Requirements and Design Drawings for the Interim Sludge Storage Facility

Document ID: TFR-WS-1
Revision ID: 0
Effective Date: 7/2/01

Technical and Functional Requirements for Warm Shop Interim Sludge Storage

TABLE OF CONTENTS

Summary

The Warm Shop has been designated the interim storage location for sludge to be removed from the V-tanks at TAN. The sludge will be stored in the Warm Shop in drums until it can be shipped to a disposal facility for final disposition. Because the sludge will contain a small amount of residual liquid, the Warm Shop must be heated to prevent freezing. Adequate lighting will also be provided to allow inspections of the integrity of the storage drums.

For the basis of this facility modification, it is assumed that TAN-607 will be maintained as an operational facility through the year 2003 to support the LOFT/Commercial Fuel Project in the Hot Shop. Therefore, building utilities such as heating, fire protection, and lighting will be available in the Warm Shop through the fall of 2003. If needed, contingency measures will be in-place to provide continued utilities support.

1. Introduction

1.1 System Identification

The system that is to be modified is the TAN Warm Shop. It will be reconfigured for the interim storage of sludge removed from the TAN V-tanks until it can be shipped to an approved disposal facility. The Warm Shop can provide the required space and utilities for the safe storage of the sludge and liquid.

1.2 Limitations

This document applies only to the TAN Warm Shop and does not apply to adjacent structures, systems or areas.

1.3 Ownership of the T&FR

INTEC Engineering

1.4 Definitions/Glossary

NA

1.5 Acronyms

ALARA	As Low As Reasonably Achievable
ECF	Engineering Change Form
EDF	Engineering Design File
ERT	Engineering Review Team
NA	Not Applicable
SAR	Safety Analysis Report
SES	Special Equipment Service
SS-SSC	Safety Significant - System, Structure, or Component
SSC	System, Structure, or Component
TAN	Test Area North
TBD	To Be Determined
TFR	Technical and Functional Requirements

2. Overview

2.1 System Functions

The Warm Shop was originally constructed as a contained shop to work on a shielded locomotive as part of the Initial Engine Test Project. Therefore, it is equipped with a large open high-bay and large doors for ease of access and still provide a contained area where work on potentially contaminated equipment could be performed. With these features, the Warm Shop can be easily modified to meet the requirements for the storage of sludge to be removed from the TAN V-tanks.

2.2 System Classification

The Warm Shop is classified as a Category II Nuclear Facility meaning that it is approved for the handling of contained fissile materials. For example, casks containing fissile material may be placed into the Warm Shop but they cannot be opened in the Warm Shop.

2.3 Operational Overview

Operation of the Warm Shop as a sludge storage facility will entail placing drums of sludge onto pallets placed into rows. The rows will be oriented to allow forklift access for delivering drums for storage and drum removal when they are sent to a treatment facility. The row orientation will also allow visual inspection of the drum integrity to ensure there are no leaks. Concrete blocks will be placed around the rows of drums to reduce exposure to personnel in the area.

3. Requirements and Bases

3.1 Functional and Performance Requirements

3.1.1 System

3.1.1.1 The interim storage configuration shall allow 100 drums to be stored such that all applicable requirements are met.

3.1.1.2 The interim storage in the Warm Shop shall comply will all applicable environmental regulations as listed in Appendix A "Environmental Interim Storage Technical and Functional Requirements."

3.1.2 Subsystem and Major Components

3.1.2.1 A secondary containment system shall be installed that meets the applicable environmental regulations.

3.1.2.2 Portable lighting fixtures shall have a substantial base to prevent tipping, shall be adjustable up to eight feet high, and shall have a 30 foot power cord that will plug into a NEMA 5-20 receptacle.

3.1.3 Boundaries and Interfaces

None identified.

3.1.4 Codes, Standards, and Regulations

DOE Order 420.1 Facility Safety

DOE Order 440.1 Worker Protection Management

NFPA 70 National Electrical Code

NFPA 70E Standard for Electrical Safety

NFPA 13 Fire Sprinkler Installation

Environmental Citations are listed in Appendix A

3.1.5 Operability

There are no operations associated with interim storage.

3.2 Special Requirements

3.2.1 Radiation and Other Hazards

3.2.1.1 Any individual worker involved in routine inspections shall not exceed an annual exposure of 0.7 rem (700 mrem) per calendar year without written prior approval from the Radiological Controls Director and the Senior Site Executive.

3.2.1.2 Any individual occupant radiation dose rate for areas outsidethe Warm Shop sahll be less that 0.1 mrem/hr.

3.2.1.3 Any individual worker radiation exposure for maintenance related activities in the Warm Shop shall be less than 5.0 mrem/hr, to the extent practical through the incorporation of shielding materials.

3.2.2 ALARA

3.2.2.1 Applicable ALARA principles shall be applied to ensure that personnel exposure to radiation is minimized and maintained below personal ALARA goals.

3.2.3 Nuclear Criticality Safety

3.2.3.1 No single drum shall contain sufficient fissile material to sustain a critical reaction.

3.2.4 Industrial Hazards

None identified.

3.2.5 Operating Environment and Natural Phenomena

3.2.5.1 Lighting shall be sufficient for WGS personnel to conduct weekly inspections of the waste containers. Portable lighting may be used to supplement the existing lighting to meet this requirement.

3.2.5.2 The heating and ventilation system shall be maintained in the Warm Shop such that the ambient room temperature shall not fall below 42 degrees F.

3.2.5.3 The interim storage operation shall survive all natural phenomena that they are required to withstand and remain operational.

3.2.6 Human Interface Requirements

3.2.6.1 The interim storage shall not interfere with maintenance personnel access to the outside perimeter walls of the Warm Shop.

3.2.7 Specific Commitments

None Identified

3.3 Engineering Design Requirements

3.3.1 Civil and Structural

3.3.1.1 The drum pallets shall be of sufficient size and structural capacity to support the drums during storage and handling.

3.3.2 Mechanical and Materials

This section is not applicable.

3.3.3 Chemical and Process

This section is not applicable.

3.3.4 Electrical Power

3.3.4.1 Electrical power shall be maintained in the Warm Shop such that overhead lighting, portable lighting, cameras, camera control station and heaters sufficient to prevent freezing if the steam heating the Warm Shop is deactivated can be operated.

3.3.5 Instrumentation and Control

3.3.6 Computer Hardware and Software

This section is not applicable.

3.3.7 Fire Protection

3.3.7.1 The fire suppression system shall be maintained such that all applicable fire codes and environmental regulations are met.

3.4 Testing and Maintenance Requirements

3.4.1 Testability

None identified.

3.4.2 TSR-Required Surveillance

None identified.

3.4.3 Non-TSR Inspections and Testing

None identified.

3.4.4 Maintenance

This section is not applicable.

3.5 Other Requirements

3.5.1 Security and SNM Protection

This section is not applicable.

3.5.2 Special Installation Requirements

This section is not applicable.

3.5.3 Reliability, Availability, and Preferred Failure Modes

This section is not applicable.

3.5.4 Quality Assurance

3.5.4.1 Quality assurance for the sludge storage project materials shall be maintained and assured by application of MCP-540 'Documenting the Safety Category of Structures, Systems and Components'.

3.5.5 Miscellaneous

None identified.

Appendix A

Environmental Interim Storage Technical and Functional Requirements

Interim Storage Technical and Functional Requirements	Citation Source	Comments
1. Before placing waste into storage at the unit a waste analysis must be completed on representative waste samples.	40 CFR 264.13 IDAPA 58.01.05.008	This is necessary in part to assure that the design and construction are sufficient to the waste being stored.
2. Measures must be taken to restrict access to the storage facility.	40CFR 264.14 (b) IDAPA 58.01.05.008	The current TAN boundary fence, security patrols, and key card access are sufficient to meet this requirement.
3. The facility must be sized and configured to permit inspection of the facility for malfunction and deterioration, and discharges.	40CFR 264.15 (b) IDAPA 58.01.05.008	This applies to monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment. Any findings must be corrected.
4. The facility must be sized and configured to permit inspection of the containers in storage for deterioration and leaks.	40CFR 264.174 IDAPA 58.01.05.008	This also includes adequate size and configuration to allow for clean up, repackaging if necessary.
5. The facility must be designed, constructed, and maintained to minimize the possibility of a fire, explosion, or unplanned release.	40CFR 264.31 IDAPA 58.01.05.008	
6. The facility must have internal alarm or emergency communication devices.	40CFR 264.34 IDAPA 58.01.05.008	
7. There shall be sufficient aisle space to allow the unobstructed movement of emergency equipment and personnel.	40CFR 264.35 IDAPA 58.01.05.008	
8. The facility shall be designed to prevent a container from being stored or handled in a manner which would cause it to rupture or leak.	40CFR 264.173 IDAPA 58.01.05.008	
9. The facility must have containment for the containers that is free of gaps or cracks and is impervious.	40CFR 264.175 (b)(1) IDAPA 58.01.05.008	

Interim Storage Technical and Functional Requirements	Citation Source	Comments
10. The base must be sloped or the containers elevated to keep them out of accumulated liquid.	40CFR 264.175 (b)(2) IDAPA 58.01.05.008	
11. The accumulated liquid must removed in a timely manner.	40CFR 264.175 (b)(5) IDAPA 58.01.05.008	
12. PCB/radioactive waste does not require a six-inch-high curbing. However, containment is still required so that the containment volume shall be equal to at least two times the internal volume of the largest PCB article or PCB container; or, 25% of the total internal volume of all PCB articles or PCB containers, whichever is greater.	40CFR 761.65(b)(1) (ii)	
13. The container storage of ignitable waste shall be at least 50 ft inside the property line.	40CFR 264.176 IDAPA 58.01.05.008	TAN Warm Shop is at least 50 ft from the INEEL property line.
14. The unit should be designed and constructed to allow for all equipment, containers, liners, bases, etc that are contaminated to be decontaminated or removed.	40CFR 264.114 40CFR 264.178 IDAPA 58.01.05.008	
15. Emissions of TAPS/HAPs must be estimated/measured	IDAPA 58.01.01. 161	
16. NESHAPS Rad emissions must be estimated/measured.	40CFR 61.91-94	
17. Adequate roof and walls shall be provided to prevent rainwater from reaching stored PCBs and PCB items.	40CFR 761.65(b)(1)(i)	Requirement satisfied
18. All PCBs and PCB items shall be stored above the 100-year flood water elevation.	40CFR 761.65(b)(1) (v)	

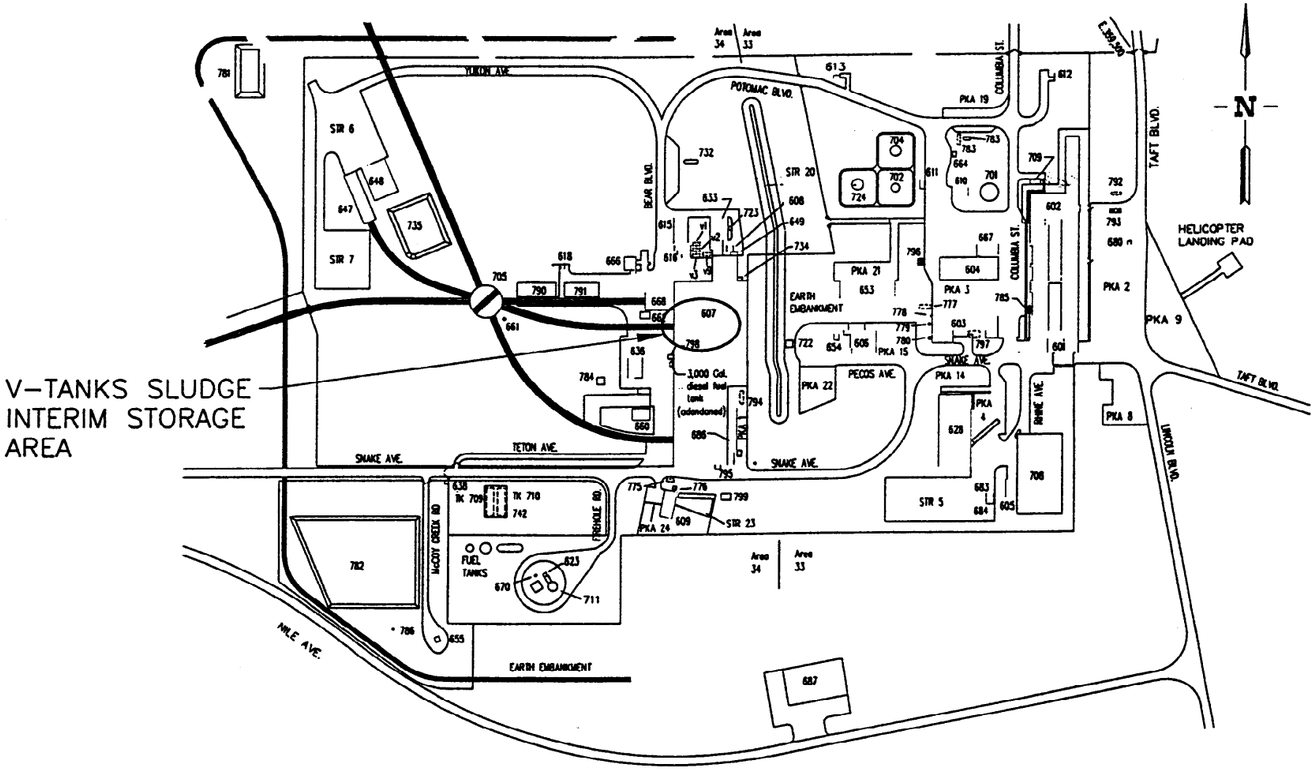
Interim Storage Technical and Functional Requirements	Citation Source	Comments
19. The floor and curbing shall be constructed of Portland cement, concrete, or a continuous, smooth, nonporous surface that prevents or minimizes penetration of PCBs.	40CFR 761.65 (b)(1)(iv)	The floor of the Warm Shop should be assessed for this requirement. Use of an epoxy resin coating, or commercial secondary containment may be a mitigating option.
20. There shall be no drains or other openings that would permit PCBs to flow from the curbed area.	40CFR 761.65 (b)(1)(iii)	The flooring under the center trench should be evaluated.
21. Utilities must be available and maintained to allow inspection of the facility for malfunction and deterioration, and discharges.	40CFR 264.15 (b) IDAPA 58.01.05.008	This applies to monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment. Any findings must be corrected.
22. The utilities must be designed, constructed, and maintained to minimize the possibility of a fire, explosion, or unplanned release.	40CFR 264.31 IDAPA 58.01.05.008	

Interim Storage Technical and Functional Requirements	Citation Source	Comments
23. The following emergency equipment shall be located in an operable condition at or near the waste management unit unless none of the hazards posed by the waste handled would require this equipment: A. an internal communications or alarm system capable of providing emergency instructions to personnel B. a telephone or two-way radio capable of summoning emergency assistance C. fire control equipment, portable fire extinguisher(s), spill control equipment, and decontamination equipment D. water at adequate volume and pressure to supply water hose streams, or foam equipment, or automatic sprinklers, or water spray systems.	40CFR 264. 32-33 IDAPA 58.01.05.008	A. Can be satisfied by the Voice Paging System. B. Two-way radio will likely be the choice in the storage area. C. Fire sprinkler system must be viable. Decontamination equipment for personnel should be addressed by an IH for the RCRA/TSCA constituents, and an RCT for the rad constituents. D. Water distribution system should be assessed for adequate water and pressure. E. A preventive maintenance program must be maintained for equipment relating to the waste storage area.
24. Each new or modified waste management unit shall be addressed in an Environmental Checklist to determine the level of National Environmental Policy Act documentation required.	Department of Energy (DOE) Order 451.1	
25. Each hazardous waste management unit shall be addressed in the facility-specific contingency plan that is designed and implemented to minimize hazards resulting from fires, explosions, or releases of hazardous waste.	40CFR 264.37 40 CFR 264.50-56 IDAPA 58.01.05.008	NOTE: Will require an emergency contact & emergency response personnel are available.
26. Portable equipment for the handling or storage of the waste may require registration.	IDAPA 58.01.01.500.02	

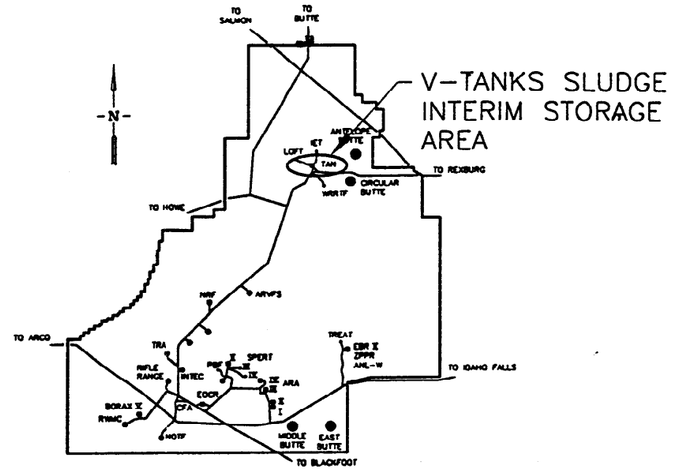
Interim Storage Technical and Functional Requirements	Citation Source	Comments
27. Storage areas shall be maintained and operated to minimize the possibility of a fire, explosion, or any release of hazardous waste.	40CFR 264.31 IDAPA 58.01.05.008	Many of the systems identified in the requirements in Sections 1.0 and 2.0 will have to be maintained. Emergency generator for heating to prevent freezing.

NOTES:
1. THIS DRAWING IS USED IN CONJUNCTION WITH DRAWINGS 518070, 518072 AND 518073.

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:



TAN/TSF AREA MAP
SCALE: 1"=200.0'



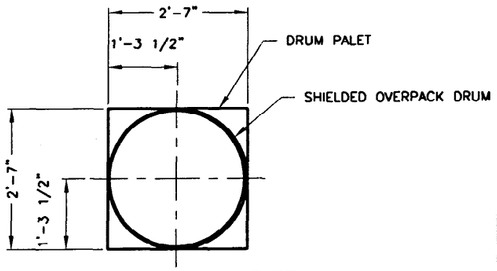
SITE MAP
SCALE: NONE

SUBCONTRACT NO.	INEEL (Idaho National Engineering & Environmental Laboratory) BECHTEL BWXT IDAHO, LLC
REQUESTER: JERRY P. SHEA	TAN/TSF V-TANKS SLUDGE INTERIM STORAGE PROJECT 607 WARM SHOP STORAGE DRUM LAYOUT AREA MAP AND SITE MAP
DESIGN: JACOB M. HARRIS	
DRAWN: L. K. SHAW	
PROJECT NO.	
SPEC CODE	
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 84811	SIZE D; CAGE CODE 01MF3; INDEX CODE NUMBER AREA 034 TYPE 0100 CI 01 OBJ 090; DWG-518069; REV
EFFECTIVE DATE:	SCALE: NOTED; SHEET 1 OF 1

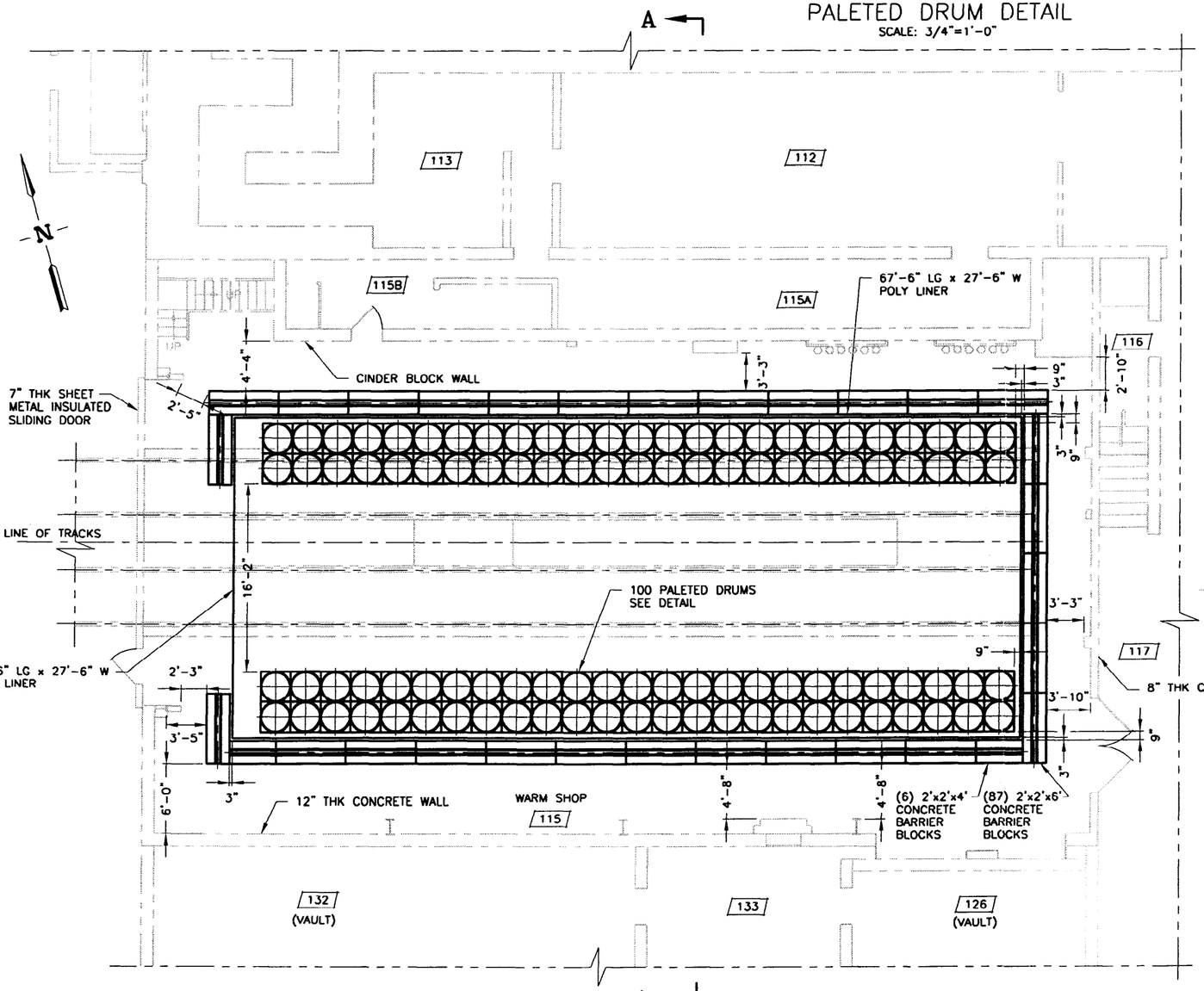
FMT-01-REV 3.3

NOTES:
1. THIS DRAWING TO BE USED IN CONJUNCTION WITH DRAWINGS 518069, 518072 AND 518073.

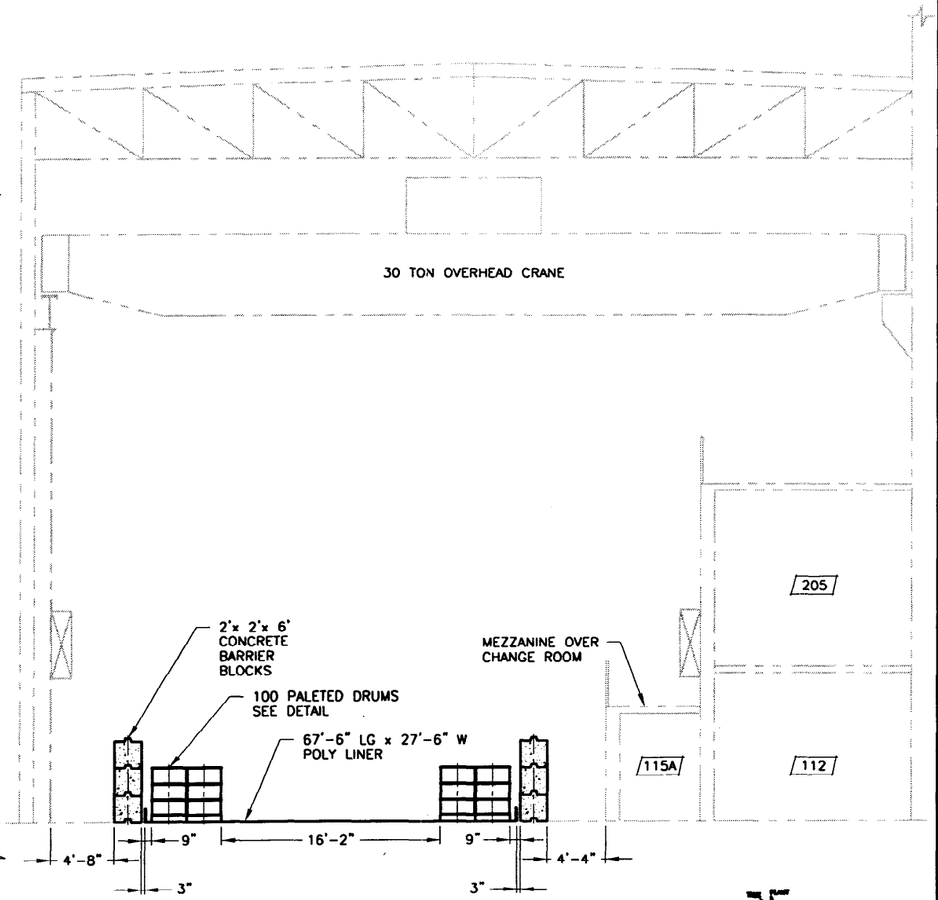
REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE



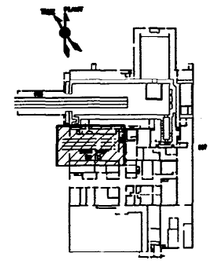
PALETED DRUM DETAIL
SCALE: 3/4"=1'-0"



A
WARM SHOP PLAN
SCALE: 3/16"=1'-0"



WARM SHOP SECTION A-A
SCALE: 3/16"=1'-0"



KEY PLAN
SCALE: NONE

SUBCONTRACT NO	
REQUESTER: JERRY P. SHEA	
DESIGN: JACOB M. HARRIS	
DRAWN: L. K. SHAW	
PROJECT NO.	
SPEC CODE	
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 84812	
EFFECTIVE DATE:	

INEEL — Idaho National Engineering & Environmental Laboratory — BECHTEL BWXT IDAHO, LLC

TAN/TSF
V-TANKS SLUDGE
INTERIM STORAGE PROJECT
PROPOSED 607 WARM SHOP
PALETED DRUM CONFIGURATION

SIZE	CAGE CODE	INDEX CODE NUMBER				DWG	REV
		AREA	TYPE	CL	ORIG		
D	01MF3	034	0607	00	090	518070	

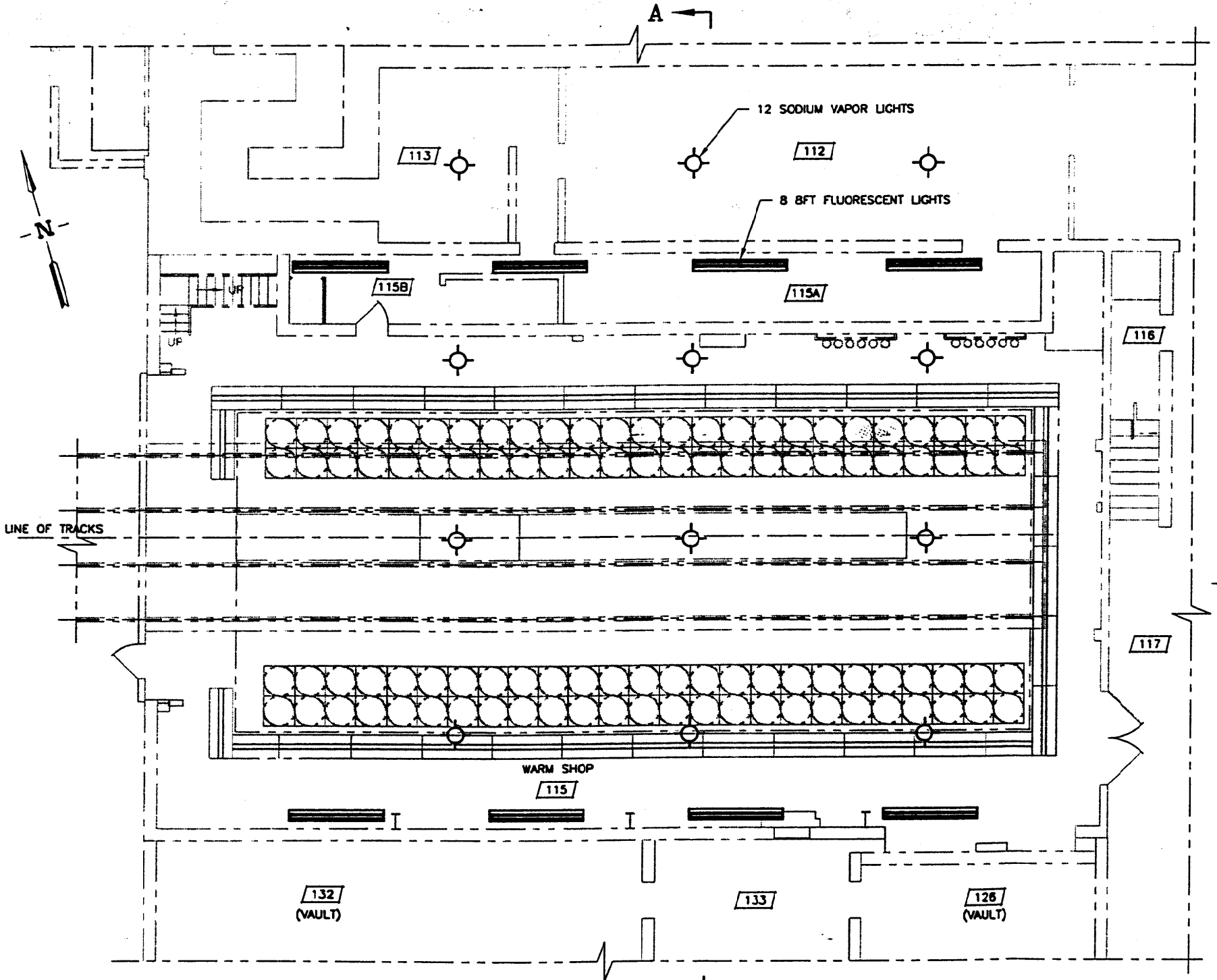
SCALE: NOTED — SHEET 1 OF 1

Drawn in Model Space ID: LKS4
Date: 09/24/01 - 09:05 A.M.
File: 518070.dwg
Path: K:

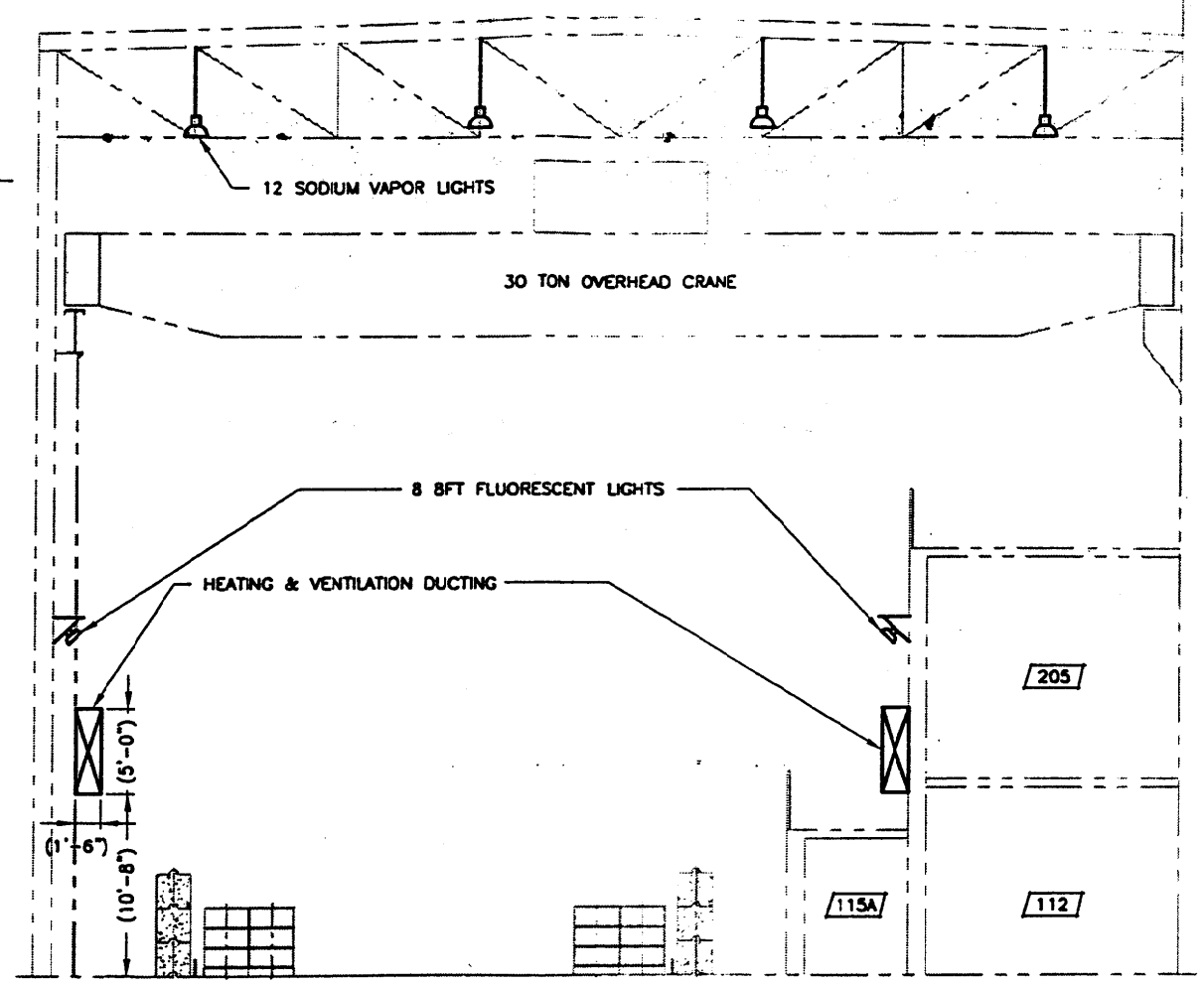
Ref-01-REV 3.3

NOTES:
1. THIS DRAWING TO BE USED IN CONJUNCTION WITH DRAWINGS 518069, 518070 AND 518073.

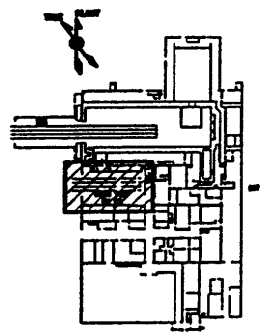
REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE



WARM SHOP PLAN
SCALE: 3/16"=1'-0"



WARM SHOP SECTION A-A
SCALE: 3/16"=1'-0"



KEY PLAN
SCALE: NONE

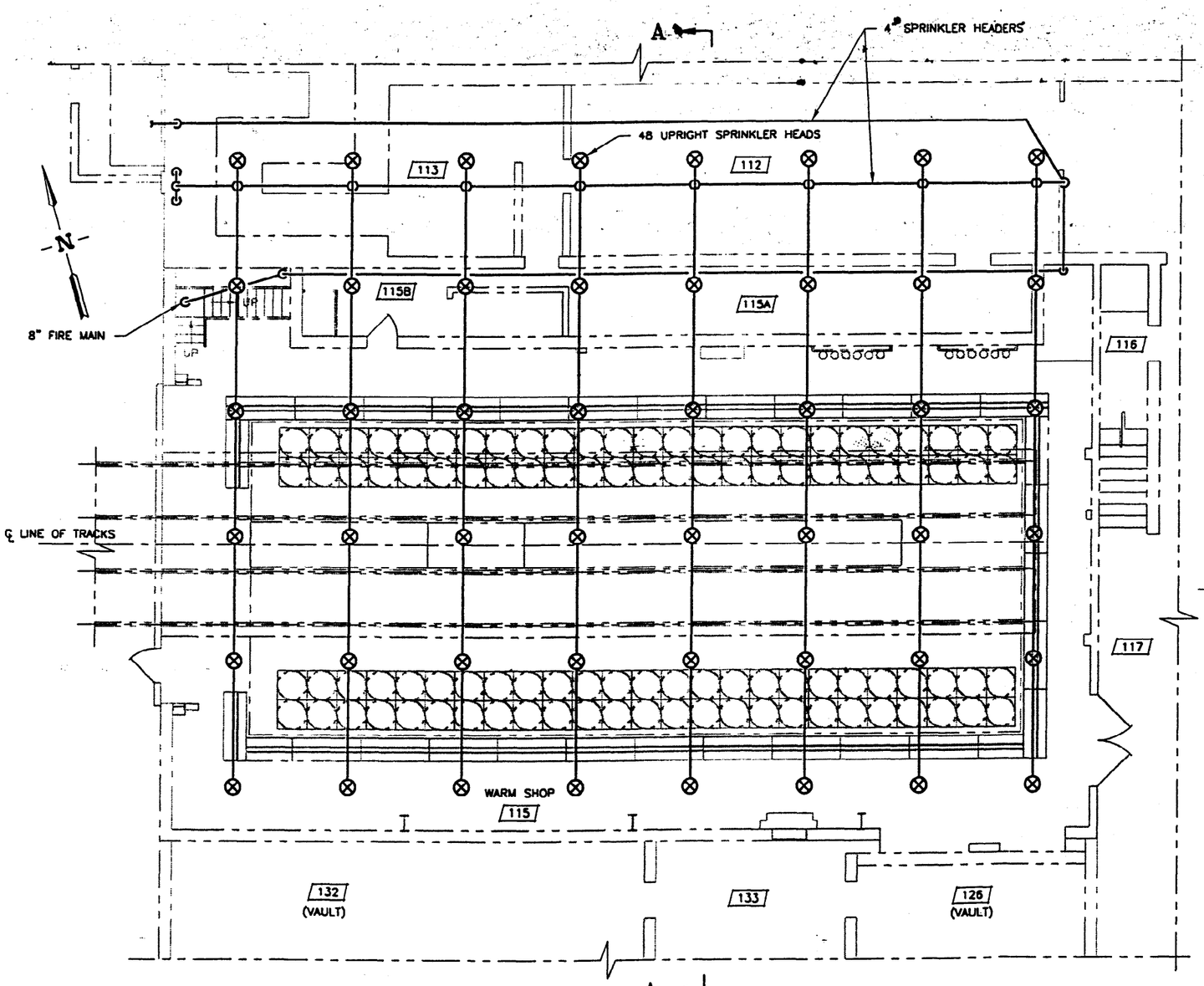
SUBCONTRACT NO.	INEEL
REQUESTER: JERRY P. SHEA	TAN/TSF
DESIGN: JACOB M. HARRIS	V-TANKS SLUDGE
DRAWN: L. K. SHAW	INTERIM STORAGE PROJECT
PROJECT NO.	607 WARM SHOP
SPEC CODE	EXISTING LIGHTING, HEATING AND VENTILATION
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 84814	SIZE: D; CAGE CODE: 01MF3; INDEX CODE NUMBER: AREA 034, TYPE 0607, A 10, ORG 090; DWG-518072; REV
EFFECTIVE DATE	SCALE: NOTED; SHEET 1 OF 1

Drawn in Model Space
Date: 08/28/01 - 11:09 A.M.
ID: LKS4

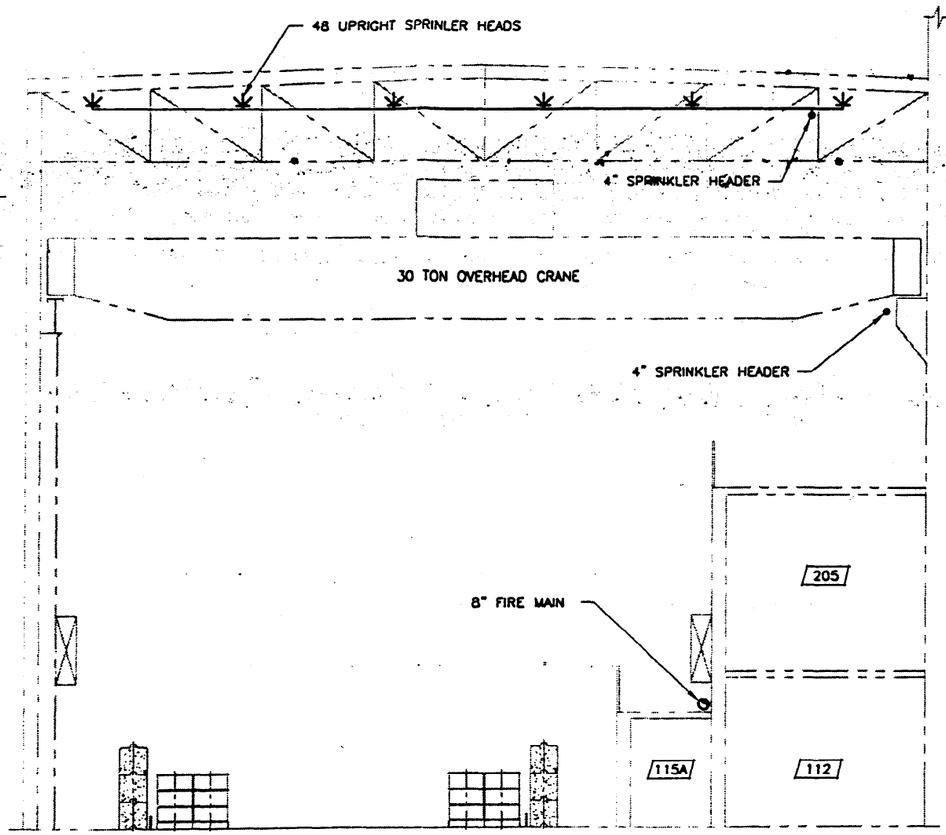
File: 518072.dwg
Path: H:\lks4

NOTES:
1. THIS DRAWING TO BE USED IN CONJUNCTION WITH DRAWINGS 518069, 518070 AND 518072.

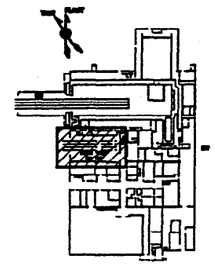
REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:



WARM SHOP PLAN
SCALE: 3/16"=1'-0"



WARM SHOP SECTION A-A
SCALE: 3/16"=1'-0"



KEY PLAN
SCALE: NONE

SUBCONTRACT NO.	INEEL (Idaho National Engineering & Environmental Laboratory) LOCKHEED MARTIN IDAHO TECHNOLOGIES COMPANY
REQUESTER: JERRY P. SHEA	TAN/TSF V-TANKS SLUDGE INTERIM STORAGE PROJECT 607 WARM SHOP EXISTING FIRE PROTECTION
DESIGN: JACOB M. HARRIS	
DRAWN: L. K. SHAW	
PROJECT NO.	
SPEC CODE	
FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 84815	SIZE: D; CAGE CODE: 01MF3; INDEX CODE NUMBER AREA: 034, TYPE: 0607, CI: 52, DISC: 090; DWG-518073; REV
EFFECTIVE DATE:	SCALE: NOTED; SHEET 1 OF 1

FP1

Drawn in Model Space
Date: 08/28/01 - 11:09 A.M.
ID: LKS4

File: 518073.dwg
Path: H:\lks4